# HOT SPRINGS COUNTY ANNEX

## 1 Mitigation Planning and County Planning Team

Hot Springs County developed this annex during the development of the 2016 Region 6 Hazard Mitigation Plan. This represents the first local hazard mitigation plan developed for the County and its municipalities. As part of the regional planning process the County established a Hazard Mitigation Planning Committee (HMPC) to develop the mitigation plan and identify potential mitigation projects. The following jurisdictions participated in the DMA planning process for the County.

- Hot Springs County
- Town of Thermopolis
- Town of East Thermopolis
- Town of Kirby

More details on the planning process followed and how the counties, municipalities and stakeholders participated can be referenced in Chapter 3 of the base plan. Additional details on which local government departments participated and who represented them are listed in Appendix A.

## 2 Geography and Climate

Hot Springs County was created on February 21, 1911. The county has a total area of 2,006 square miles, making it the smallest county by area in Wyoming. The Absaroka Mountain Range lies on the west side of the county, while the Bridger Mountains surround the east side. Hot Springs County also includes the southern portion of Bighorn Basin.

Counties adjacent to Hot Springs include Washakie, Fremont, and Park County. Towns include Thermopolis, East Thermopolis and Kirby.

The County experiences a semi-arid climate with long, cold, dry winters and hot, dry summers. The average high temperature is 65.53 and the average low temperature is around 33.53 with the average annual precipitation around 12.04 inches per year.

## 3 Population Trends

As of the 2010 United States Census, there were a total of 4,812 people living in Hot Springs County. With a population of 4,882 people recorded in the 2000 US Census, the county's population decreased by 1.45% in that timeframe. The county's population was estimated at 4,741 in 2015, showing a decrease by 1.5%.

The Town of Thermopolis is the County's principal population center.

## Table 3.1. Population Estimates for Communities 2010-2015

| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|
| Thermopolis | 3,010 | 3,015 | 3,035 | 3,037 | 3,005 | 2,974 |
| East Thermopolis | 254 | 254 | 255 | 254 | 251 | 248 |
| Kirby | 92 | 93 | 93 | 93 | 93 | 92 |

Source: American Factfinder, U.S. Census www.census.gov

Select Census demographic and social characteristics for Hot Springs County are shown in Table 3.2. The table indicates the proportion of the population that may have special needs, such as the elderly or children under 5 years of age.

### Table 3.2. Hot Springs County Demographic Profile

| People | Hot Springs County |
|---|---|
| ***Population*** | |
| Population estimates, July 1, 2015, (V2015) | 4,741 |
| Population, percent change - April 1, 2010 (estimates base) to July 1, 2015, (V2015) | -1.5 |
| Population, Census, April 1, 2010 | 4,812 |
| ***Age and Sex*** | |
| Persons under 5 years, percent, July 1, 2015, (V2015) | 4.5 |
| Persons under 18 years, percent, July 1, 2015, (V2015) | 20.6 |
| Persons 65 years and over, percent, July 1, 2015, (V2015) | 24.3 |
| Female persons, percent, July 1, 2015, (V2015) | 49.5 |
| ***Race and Hispanic Origin*** | |
| White alone, percent, July 1, 2015, (V2015) (a) | 95.6 |
| Black or African American alone, percent, July 1, 2015, (V2015) (a) | 0.6 |
| American Indian and Alaska Native alone, percent, July 1, 2015, (V2015) (a) | 1.7 |
| Asian alone, percent, July 1, 2015, (V2015) (a) | 0.6 |
| Native Hawaiian and Other Pacific Islander alone, percent, July 1, 2015, (V2015) (a) | 0.1 |
| Two or More Races, percent, July 1, 2015, (V2015) | 1.5 |
| Hispanic or Latino, percent, July 1, 2015, (V2015) (b) | 4.5 |
| White alone, not Hispanic or Latino, percent, July 1, 2015, (V2015) | 91.5 |
| ***Education*** | |
| High school graduate or higher, percent of persons age 25 years+, 2010-2014 | 87.5 |
| Bachelor's degree or higher, percent of persons age 25 years+, 2010-2014 | 19.5 |

Source: U.S. Census Bureau www.census.gov/
*Hispanic or Latino is considered to be an ethnicity and not a race. People who identify themselves as Hispanic or Latino can belong to one or more races. Therefore, the total percentage can be greater than 100%.

# 4 Development Trends

During the 2016 Regional Plan development the HMPC discussed growth and development trends in the County including:

- Future development in East Thermopolis includes a large-scale renovation and modernization project at the Hot Springs County Memorial Hospital.
- The Wyoming Dinosaur Center, currently located in East Thermopolis has purchased land south of Thermopolis for development.
- Though there is no growth into timbered areas at this time, the potential exists for range/grassland fires to threaten housing in all areas of Hot Springs County.

- Building in the rural areas south and west of Thermopolis continues at a steady pace. There are a few small subdivisions, but main development is on small acreage parcels-5 acres or less.

# 5 Economy

Hot Springs County's economic base includes farming, ranching, tourism, retail, healthcare, and oil and gas industry. Economic statistics are noted below.

**Table 5.1 Hot Springs County Economic Profile**

| Characteristic | Hot Springs County |
|---|---|
| In civilian labor force, total, percent of population age 16 years+, | 59.2 |
| In civilian labor force, female, percent of population age 16 years+, | 54.4 |
| Total accommodation and food services sales, 2012 ($1,000) (c) | D |
| Total health care and social assistance receipts/revenue, 2012 | 34,208 |
| Total manufacturers' shipments, 2012 ($1,000) (c) | 8,020 |
| Total merchant wholesaler sales, 2012 ($1,000) (c) | 13,134 |
| Total retail sales, 2012 ($1,000) (c) | 48,213 |
| Total retail sales per capita, 2012 (c) | 9,999 |
| Median household income (in 2014 dollars), 2010-2014 | 45,385 |
| Per capita income in past 12 months (in 2014 dollars), 2010-2014 | 27,548 |
| Persons in poverty, percent | 10.9 |
| Total employer establishments, 2014 | 176 |
| Total employment, 2014 | 1,657 |
| Total annual payroll, 2014 | 62,772 |
| Total employment, percent change, 2013-2014 | -0.7 |
| Total non-employer establishments, 2014 | 400 |

Source: U.S. Census Bureau www.census.gov/

# 6 Hazard Identification and Risk Assessment

## 6.1 Identified Hazards

The HMPC reviewed significant hazards for inclusion in the hazard mitigation plan. For the sake of consistency, the list of hazards for consideration began with the list of hazards found in the State of Wyoming's Hazard Mitigation Plan, updated in 2016. Also reviewed were the existing hazard mitigation plans for other counties in the Region including Washakie, Bighorn, and Park. Upon further review the county used the same list in the State plan. The HMPC did not add any additional hazards with the exception of hazardous materials.

The County has also completed a Wyoming Public Health Risk Assessment Tool/Jurisdictional Risk Assessment in March 2016 as part of an informational gathering effort by the Wyoming Department of Health. This document identifies additional human-caused hazards that are beyond the scope of this regional plan. Table 6.1. Overall Hazard Significance* Summary Table provides a summary of the overall hazard significance for the hazards evaluated in this plan.

## Table 6.1. Overall Hazard Significance* Summary Table

| Hazard | Hot Springs County | Thermopolis | East Thermopolis | Kirby |
|---|---|---|---|---|
| **Avalanche** | Low | Low | Low | Low |
| **Dam Failure** | High | High | High | High |
| **Drought** | High | High | High | High |
| **Earthquake** | Medium | Medium | Medium | Medium |
| **Expansive Soils** | Low | Low | Low | Low |
| **Extreme Cold** | Medium | Medium | Medium | Medium |
| **Flood** | Medium | Medium | Medium | Low |
| **Hail** | Low | Low | Low | Low |
| **Hazardous Materials** | High | High | High | High |
| **High Winds and Downbursts** | Low | Low | Low | Low |
| **Landslide** | High | High | High | Low |
| **Lightning** | Low | Low | Low | Low |
| **Mine Subsidence** | Low | Low | Low | Low |
| **Tornado** | Low | Low | Low | Low |
| **Severe Winter Weather** | Medium | Medium | Medium | Medium |
| **Wildfire** | High | High | High | Medium |

*Significance based on a combination of Geographic Extent, Potential Magnitude/Severity and Probability as defined below.

**Geographic Extent**
Negligible: Less than 10 percent of planning area or isolated single-point occurrences
Limited: 10 to 25 percent of the planning area or limited single-point occurrences
Significant: 25 to 75 percent of planning area or frequent single-point occurrences
Extensive: 75 to 100 percent of planning area or consistent single-point occurrences

**Potential Magnitude/Severity**
Negligible: Less than 10 percent of property is severely damaged, facilities and services are unavailable for less than 24 hours, injuries and illnesses are treatable with first aid or within the response capability of the jurisdiction.
Limited: 10 to 25 percent of property is severely damaged, facilities and services are unavailable between 1 and 7 days, injuries and illnesses require sophisticated medical support that does not strain the response capability of the jurisdiction, or results in very few permanent disabilities.
Critical: 25 to 50 percent of property is severely damaged, facilities and services are unavailable or severely hindered for 1 to 2 weeks, injuries and illnesses overwhelm medical support for a brief period of time, or result in many permanent disabilities and a few deaths.
Catastrophic: More than 50 percent of property is severely damaged, facilities and services are unavailable or hindered for more than 2 weeks, the medical response system is overwhelmed for an extended period of time or many deaths occur.

**Probability of Future Occurrences**
Unlikely: Less than 1 percent probability of occurrence in the next year, or has a recurrence interval of greater than every 100 years.
Occasional: Between a 1 and 10 percent probability of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
Likely: Between 10 and 90 percent probability of occurrence in the next year, or has a recurrence interval of 1 to 10 years
Highly Likely: Between 90 and 100 percent probability of occurrence in the next year, or has a recurrence interval of less than 1 year.

**Overall Significance**
Low: Two or more of the criteria fall in the lower classifications or the event has a minimal impact on the planning area. This rating is also sometimes used for hazards with a minimal or unknown record of occurrences/impacts or for hazards with minimal mitigation potential.
Medium: The criteria fall mostly in the middle ranges of classifications and the event's impacts on the planning area are noticeable but not devastating. This rating is also sometimes utilized for hazards with a high impact rating but an extremely low occurrence rating.
High: The criteria consistently fall along the high ranges of the classification and the event exerts significant and frequent impacts on the planning area. This rating is also sometimes utilized for hazards with a high psychological impact or for hazards that the jurisdiction identifies as particularly relevant.

## 6.2 Building Inventory and Assets

In addition to people, structures, critical facilities and infrastructure, and other important assets in Hot Springs County are potentially exposed to hazards identified in this plan. Table 6.2 summarizes the property inventory for the County and each participating jurisdiction, based on improvement value (i.e. structures) and includes the building count and value grouped by parcel type and jurisdiction. This as an assessment of the overall property exposed within the County and by jurisdiction.

The 2016 Parcel and Assessor Data was obtained through the Wyoming Cama website (http://cama.state.wy.us/) which is maintained by the Wyoming Department of Revenue. This information provided the basis for building exposure and property types. The available data is annually updated on the site and contains all counties within Wyoming. Data current as of 2015 was downloaded for all the counties within the Region and joined by Parcel Number in a separate database for analysis using GIS. The focus of the analysis was on "improved" or developed parcels. These parcels were identified based on an improvement value greater than zero. Abstract Codes were used to identify occupancy type as shown in the following table, which includes summations of total improved value for the various property types.

**Table 6.2. Hot Springs County's Building Inventory and Value by Jurisdiction**

| Jurisdiction | Property Type | Building Count | Improved Value | Est. Content Value | Total Exposure |
|---|---|---|---|---|---|
| East Thermopolis | Commercial | 5 | $791,775 | $791,775 | $1,583,550 |
| | Residential | 98 | $5,625,774 | $2,812,887 | $8,438,661 |
| | **Total** | **103** | **$6,417,549** | **$3,604,662** | **10,022,211** |
| Kirby | Commercial | 2 | $115,908 | $115,908 | $231,816 |
| | Industrial | 2 | $2,078,210 | $3,117,315 | $5,195,525 |
| | Residential | 39 | $1,953,264 | $976,632 | $2,929,896 |
| | **Total** | **43** | **$4,147,382** | **$4,209,855** | **8,357,237** |
| Thermopolis | Commercial | 164 | $27,591,776 | $27,591,776 | $55,183,552 |
| | Exempt | 1 | $139,276 | $139,276 | $278,552 |
| | Industrial | 4 | $645,983 | $968,975 | $1,614,958 |
| | Residential | 1,196 | $112,467,671 | $56,233,836 | $168,701,507 |
| | Vacant Land | 4 | $332,489 | $332,489 | $664,978 |
| | **Total** | **1,369** | **$141,177,195** | **$85,266,351** | **226,443,546** |
| Hot Springs Unincorporated | Agricultural Production | 63 | $8,758,340 | $8,758,340 | $17,516,680 |
| | Commercial | 66 | $12,780,100 | $12,780,100 | $25,560,200 |
| | Exempt | 10 | $1,648,689 | $1,648,689 | $3,297,378 |
| | Industrial | 4 | $2,977,689 | $4,466,534 | $7,444,223 |
| | Residential | 481 | $72,506,821 | $36,253,411 | $108,760,232 |
| | Vacant Land | 6 | $1,481,468 | $1,481,468 | $2,962,936 |
| | **Total** | **630** | **$100,153,107** | **$65,388,541** | **165,541,648** |
| | **Grand Total** | **2,145** | **$251,895,233** | **$158,469,409** | **$410,364,642** |

Source: (http://cama.state.wy.us/)

### 6.2.1 Critical Facilities, Infrastructure, and Other Important Community Assets

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. FEMA's HAZUS-MH loss estimation software uses the following three categories of critical assets. Essential facilities are those that if damaged would have devastating impacts on disaster response and/or recovery. High potential loss facilities are those that would have a high loss or impact on the community. Transportation and lifeline facilities are a third category of critical assets. Examples of each are provided below.

## Table 6.3. Critical Facilities Categories

| Essential Facilities | High Potential Loss Facilities | Transportation and Lifelines |
|---|---|---|
| • Hospitals and other medical facilities<br>• Police stations<br>• Fire station<br>• Emergency Operations Centers | • Power plants<br>• Dams and levees<br>• Military installations<br>• Hazardous material sites<br>• Schools<br>• Shelters<br>• Day care centers<br>• Nursing homes<br>• Main government buildings | • Highways, bridges, tunnels<br>• Railroads and facilities<br>• Airports<br>• Water treatment facilities<br>• Natural gas and oil facilities and pipelines<br>• Communications facilities |

HMPC members were asked to identify the assets in their respective jurisdictions that they considered to be critical facilities or of particular importance/value. Table 6.4 displays the inventory of these assets in Hot Springs County, by jurisdiction, as provided by the HMPC. Much of this data has been captured in secure GIS databases and could be used in an overlay analysis. The HMPC has noted which assets are threatened by specific hazards, if known. This has been supplemented with limited GIS-based critical facility data from HAZUS-MH, for purposes of analysis, as illustrated in the following table.

## Table 6.4. Hot Springs County Critical Facilities by Function

| Type | Facility Function | Jurisdiction |
|---|---|---|
| Air Facility | AIRPORT | HOT SPRINGS |
| Bridges (36) | | HOT SPRINGS |
| Communications (28) | | HOT SPRINGS |
| Communications (6) | | Thermopolis |
| Day Care Center | | Thermopolis |
| Day Care Center | | Thermopolis |
| Day Care Center | | East Thermopolis |
| EMS | | Thermopolis |
| EMS | | Thermopolis |
| Fire Station | | Thermopolis |
| HAZMAT | CERCLIS Facility | Thermopolis |
| HAZMAT | TSCA Facility | HOT SPRINGS |
| HAZMAT | TSCA Facility | HOT SPRINGS |
| Hospital | | Thermopolis |
| Hospital | | Thermopolis |
| Law Enforcement | POLICE DEPARTMENTS (EXCEPT AMERICAN INDIAN OR ALA*) | Thermopolis |
| Law Enforcement | SHERIFFS' OFFICES (EXCEPT COURT FUNCTIONS ONLY) | Thermopolis |
| Local EOC | | Thermopolis |

| Type | Facility Function | Jurisdiction |
|---|---|---|
| Nursing Home | HOMES FOR THE ELDERLY (ASSISTED LIVING FACILITIES) | Thermopolis |
| Nursing Home | NURSING FACILITIES | Thermopolis |
| Private School | Elementary | HOT SPRINGS |
| Public Health Department | | Thermopolis |
| Public School | High | Thermopolis |
| Public School | Middle | Thermopolis |
| Public School | Primary | Thermopolis |
| Public School | Unknown | HOT SPRINGS |
| Water Treatment Plant | | Thermopolis |
| Wastewater Treatment Plant | | Thermopolis |

For a detailed list of bridges and communications towers that are within the critical facilities table, refer to the electronic appendix of Critical Facilities (Appendix F).

## 6.2.2 Natural, Historic, and Cultural Assets

Assessing the vulnerability of Hot Springs County to disasters also involves inventorying the natural, historical, and cultural assets of the area. This step is important for the following reasons:

- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

### Historic and Cultural Resources

By definition, a historic property not only includes buildings of other types of structures, such as bridges and dams, but also includes prehistoric of Native American sites, roads, byways, historic landscapes, and many other features. Given the history of the County, these types of historic properties exist in the planning area.

Information about historic assets in Hot Springs County came from the following sources:

- The **National Register of Historic Places** is the Nation's official list of cultural resources worthy of preservation. The National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect historic and archeological resources. Properties listed include districts, sites, buildings, structures, and objects that are

significant in American history, architecture, archeology, engineering, and culture. The National Register is administered by the National Park Service, which is part of the U.S. Department of the Interior.

Table 6.5 lists the properties and districts in Hot Springs County that are on the National Register of Historic Places.

### Table 6.5. Hot Springs County Historic Properties

| Site | Jurisdiction | Address |
|---|---|---|
| Legend Rock Petroglyph Site | Grass Creek | Address Restricted |
| Kirby Jail and Town Hall | Kirby | 120 E. 4th St. |
| Downtown Thermopolis Historic District | Thermopolis | Broadway, 5th and 6th Sts. |
| CQA Four Mile Bridge | Thermopolis | WY 173 |
| EFP Bridge over Owl Creek | Thermopolis | Cty. Rd. CN15-28 |
| Woodruff Cabin Site | Thermopolis | 26 mi. NW of Thermopolis |
| US Post Office--Thermopolis Main | Thermopolis | 440 Arapahoe St. |
| Callaghan Apartments | Thermopolis | 116 E. Park St. |
| Halone, Alex, House | Thermopolis | 204 Amoretti St. |
| Bates Battlefield | Unknown | Bates Creek |

Sources: National Register Information System, www.nr.nps.gov/

Another site of importance in terms of historic, cultural, and natural resources is Hot Springs State Park adjacent to Thermopolis and East Thermopolis. The park is a major economic driver for the County and surrounding communities and due to its location along the Bighorn River can be prone to flooding.

## Natural Resources

Natural resources are important to include in benefit-cost analyses for future projects and may be used to leverage additional funding for projects that also contribute to community goals for protecting sensitive natural resources. Awareness of natural assets can lead to opportunities for meeting multiple objectives. For instance, protecting wetlands areas protects sensitive habitat as well as attenuates and stores floodwaters.

A number of natural resources exist in Hot Springs County, including wetlands, endangered species, and imperiled plant communities. Also, the scenery itself, and access to the scenic backcountry, are economic drivers for the County and its communities.

### *Wetlands*

Wetlands are a valuable natural resource for communities, due to their benefits to water quality, wildlife protection, recreation, and education, and play an important role in hazard mitigation. Wetlands reduce flood peaks and slowly release floodwaters to downstream areas. When surface runoff is dampened, the erosive powers of the water are greatly diminished. Furthermore, the reduction in the velocity of inflowing water as it passes through a wetland helps remove sediment being transported by the water. They also provide drought relief in water-scarce areas where the relationship between water storage and streamflow regulation are vital.

### *Endangered Species*

To further understand natural resources that may be particularly vulnerable to a hazard event, as well as those that need consideration when implementing mitigation activities, it is important to identify at-risk species (i.e., endangered species) in the planning area. An endangered species is any species of fish, plant life, or wildlife that is in danger of extinction throughout all or most of its range. A threatened species is a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Both endangered and threatened species are protected by law and any future hazard mitigation projects are subject to these laws. Candidate species are plants and animals that have been proposed as endangered or threatened but are not currently listed.

As of July 2016, there are seven federally-recognized endangered, threatened, or candidate species in Hot Springs County according to the U.S. Fish and Wildlife Service. These species are listed in Table 6.6 along with state listed species.

**Table 6.6. Endangered and Threatened Species in Hot Springs County**

| Common Name | Scientific Name | Type of Species | Status |
|---|---|---|---|
| Bald eagle | Haliaeetus Leucocephalus | Bird | State Threatened (recovery) |
| Whitebark pine | Pinus albicaulis | Conifers and Cycads | Candidate |
| Ute ladies'-tresses | Spiranthes diluvialis | Flowering Plant | Threatened |
| Grizzly bear | Ursus arctos horribilis | Mammal | Threatened |
| Black-footed ferret | Mustela Nigripes | Mammal | Endangered |
| Gray wolf | Canis lupus | Mammal | Experimental Population, Non-Essential |
| Canada Lynx | Lynx Canadensis | Mammal | Threatened |

Source: http://www.fws.gov/endangered/

## 6.3 Vulnerability to Specific Hazards

This section details vulnerability to specific hazards, where quantifiable, only where it differs from that of the Region. The results of detailed GIS analyses used to estimate potential for future losses are presented here, in addition to maps of hazard areas and details by jurisdiction and building type. For a discussion of the methodology used to develop the loss estimates refer to Chapter 4 of the base plan. In many cases Chapter 4 contains information that differentiates the risk by county thus the information is not duplicated here. For most of the weather-related hazards the risk does not vary significantly enough from the rest of the Region and thus the reader should refer to Chapter 4. Only unique issues or vulnerabilities are discussed, where applicable.

- Avalanche
- Dam Failure
- Drought
- Earthquake
- Extreme Cold
- Expansive Soils
- Flood
- Hail
- Hazards Materials
- High Winds and Downbursts
- Landslide, Debris Flow and Rockfall
- Lightning
- Mine Subsidence
- Tornado
- Wildfire
- Winter Weather

### 6.3.1 Avalanche

Avalanche prone areas are limited to the far west part of the County but have had negligible impact. Refer to Chapter 4 in the base plan for a discussion of general avalanche risk in the Region.

### 6.3.2 Dam Failure

Due to the presences of Boysen dam upstream of the County and major population centers including Thermopolis and East Thermopolis there is considerable risk to dam failure. There are also many dams upstream above Boysen in Fremont County. A table and map in Chapter 4 indicates the High and Significant Hazard dams upstream of the County.

Boysen Dam and Reservoir is an earthen dam located on the Wind River, approximately 20 miles south of Thermopolis in Fremont County. The current dam is operated by the U.S. Federal Bureau

of Reclamation, and is an earth-filled dam with a structural height of 220 feet. Total flood damages reduced by the reservoir since construction totaled about $75.0 million by the end of 1998. This dam was last inspected on June 22, 2010. If Boysen Dam fails, impacts could be significant to Thermopolis, East Thermopolis, the unincorporated areas along the Bighorn River, and Kirby, including loss of life.

The Anchor Dam is the only High Hazard dam in the County. It has a dike built to keep water from going into sinkholes nearby. Failure of the dam would impact Owl Creek and homes along stream. It has some flood control but is mostly intended for irrigation purposes. It has an Emergency Action Plan and warning system.

### 6.3.3 Drought

Similar to the rest of the Region drought is a high significance hazard for the County. Members of the HMPC noted the following regarding water supply and impacts from drought in Hot Springs County:

- Water supply in Hot Springs County comes from rivers, wells, and groundwater recovery;
- Senior Water Right calls on the Bighorn River during times of drought can result in lower flows. The Hot Springs flows can be impacted by low river flows. The State has the option to buy water from Boysen Reservoir during drought;
- Grazing cattle are impacted the most during intense drought;
- Owl Creek has a cyclical flow depending on drought; and
- 1996-1998 fire season occurred during a drought. So emergency services could not use County water for firefighting.

Refer to the Chapter 4 in the Base Plan for additional discussion of drought risk related to the Region and the County.

### 6.3.4 Extreme Cold

Vulnerability to extreme cold is not noticeably different from the rest of the region and is considered a medium significance hazard. Refer to Chapter 4 for a discussion of this hazard's risk related to Hot Springs County and the Region. Members of the HMPC noted that extreme cold contributed to an ice jam on the Bighorn River in January of 2016 and sometimes results in burst pipes, power outages, and impacts to trees.

### 6.3.5 Earthquake

As discussed in Chapter 4 earthquakes are low probability but could have considerable impacts in Hot Springs County. During the 2016 Regional Plan development the HMPC noted the following potential consequences of earthquake in Hot Springs County:

- Earthquakes pose a risk to Boysen dam and railroad tunnels;

- The age of buildings is an issue as older and historic buildings in the County and Thermopolis are more vulnerable to earthquake shaking; and
- A concern was raised that if earthquakes affected the flow of the Hot Springs, which is a natural and cultural resource, it would affect the local economy.

### 6.3.6 Expansive Soils

Expansive soils causes occasional problems in the County. During the 2016 Regional Plan development the HMPC noted the following consequences of expansive soils in Hot Springs County:

- Some houses were made inhabitable south of Thermopolis by this hazard;
- Issues on Highways; and
- Added costs to building middle school to mitigate impacts.

Data did not exist to provide a more quantitative loss estimate. See Chapter 4 for more description on the expansive soils hazard.

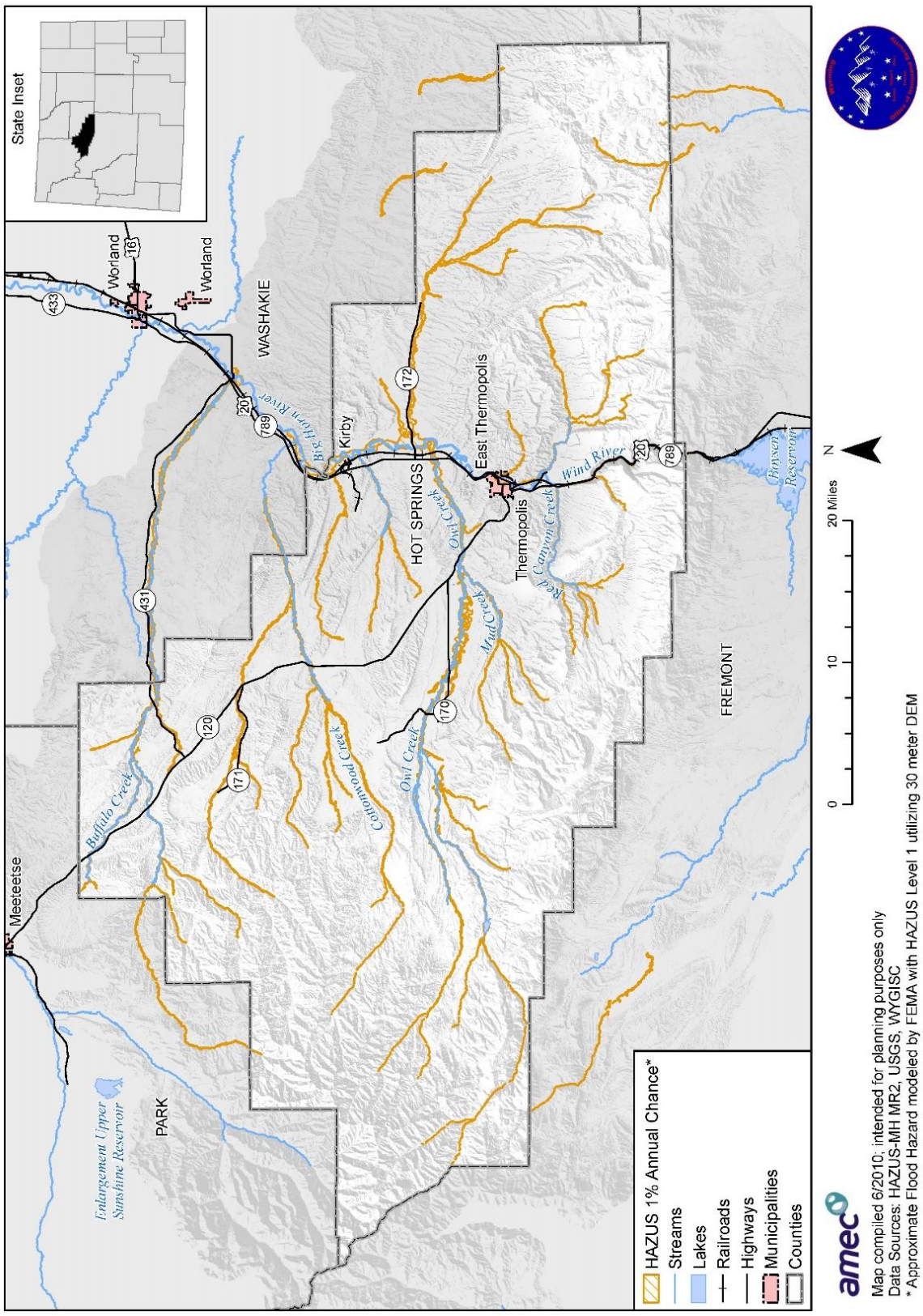
### 6.3.7 Flood

During the 2016 Regional Plan development the HMPC noted the following consequences of flood hazards in Hot Springs County:

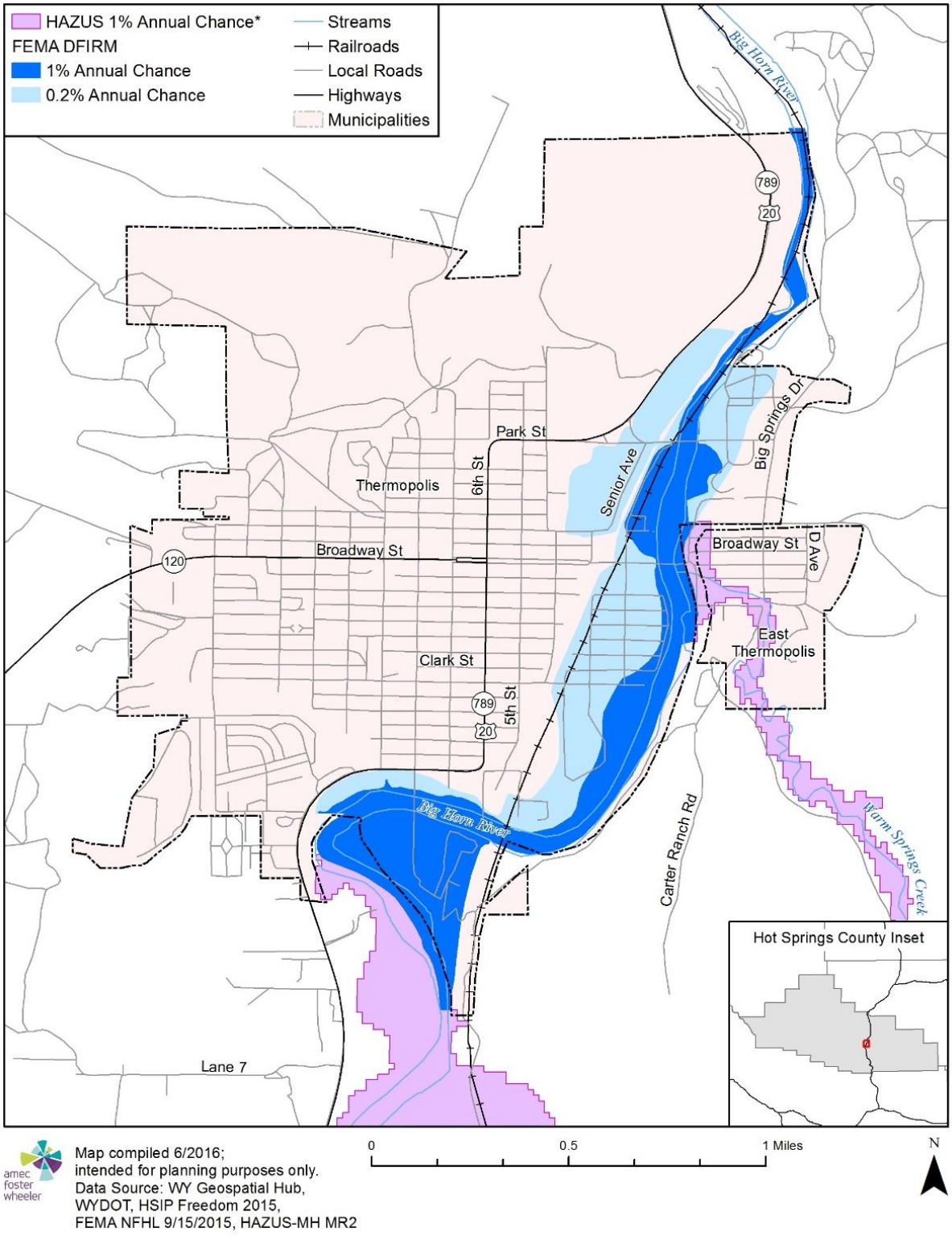
- High releases from Boysen Reservoir can result in flooding along the Bighorn River;
- The 300 year event in 1923 was pre-Boysen Reservoir. The Reservoir provides some flood mitigation;
- Some ice jams have occurred that have backed floodwaters into Thermopolis (1980s and January 2015);
- Prone to flash flooding: Owl Creek, Kirby Creek, Buffalo Creek, Sand Draw, Buffalo, Gooseberry and Grass Creeks and other small creeks, washes and drainages (small watershed between dam and Thermopolis), Red Canyon (flooded into town based on anecdote);
- Hot Springs State Park is a main economic draw and also has areas prone to flooding; and
- There is no flood hazard mapping in the unincorporated area

The following maps show approximate flood hazards in specific areas of Hot Springs County, largely based on HAZUS-generated approximate flood hazard areas. FIRM mapping and analysis only exists for Thermopolis. The FIRM was digitized during the 2016 planning effort to accommodate a more accurate flood risk analysis with GIS.

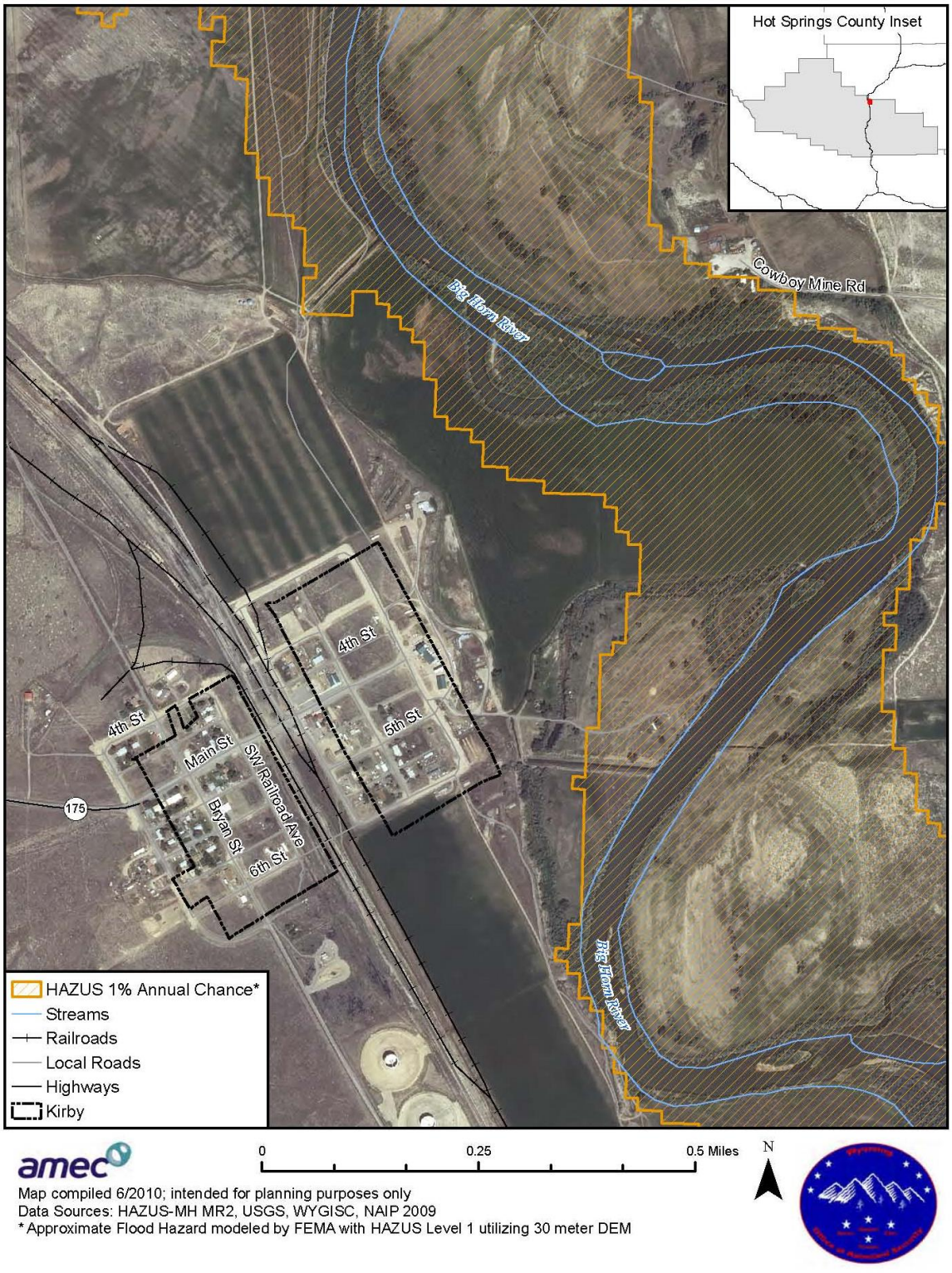
## Figure 6.1. Hot Springs County HAZUS Flood Hazards



## Figure 6.2. Town of Thermopolis and East Thermopolis Flood Hazards



## Figure 6.3. Town of Kirby HAZUS Flood Hazards



## Potential Loss in 100-year and 500-year Floodplains

The following data results from analysis of available HAZUS and DFIRM data, and shows potential impacts from flooding, including the number or people vulnerable, total building exposure, and associated costs related to a 100 year or 1% annual chance flood and where data permits the 500 year or 0.2% annual chance flood. Two analyses are provided. The first is based on a GIS analysis based on improved parcels using a digitized FIRM for Thermopolis and an approximate HAZUS-generated floodplain for the remainder of the County. The results of a 2010 HAZUS flood analysis, based on HAZUS inventory data, are also included to show additional economic losses.

### Table 6.7. Summary of Floodplain Population Information

| | Total # of Buildings | Population Estimate |
|---|---|---|
| 100 yr. flood | 120 | 191 |
| 500 yr. flood | 114 | 216 |
| Total flood** | 234 | 407 |

## Parcel Level Analyses

The following results show potential impacts from flooding, including the number or people vulnerable, total building exposure, and associated costs related to a general flooding incident based on a parcel level analysis.

### Table 6.8. Exposure and Potential Loss in 100-year Floodplain by Jurisdiction and Property Type

| Jurisdiction | Property Type | Building Count | Improved Value | Est. Content Value | Total Exposure | Potential Loss | Population |
|---|---|---|---|---|---|---|---|
| East Thermopolis | Commercial | 2 | $155,812 | $155,812 | $311,624 | $77,906 | |
| | Residential | 16 | $1,517,987 | $758,994 | $2,276,981 | $569,245 | 34 |
| | **Total** | **18** | **$1,673,799** | **$914,806** | **$2,588,605** | **$647,151** | |
| Thermopolis | Commercial | 1 | $125,795 | $125,795 | $251,590 | $62,898 | |
| | Industrial | 2 | $364,816 | $547,224 | $912,040 | $228,010 | |
| | Residential | 14 | $1,206,158 | $603,079 | $1,809,237 | $452,309 | 30 |
| | **Total** | **17** | **$1,696,769** | **$1,276,098** | **$2,972,867** | **$743,217** | |
| Hot Springs Unincorporated | Agricultural Production | 17 | $3,555,520 | $3,555,520 | $7,111,040 | $1,777,760 | |
| | Commercial | 8 | $1,009,529 | $1,009,529 | $2,019,058 | $504,765 | |
| | Residential | 60 | $7,988,350 | $3,994,175 | $11,982,525 | $2,995,631 | 127 |
| | **Total** | **85** | **$12,553,399** | **$8,559,224** | **$21,112,623** | **$5,278,156** | |
| | **Grand Total** | **120** | **$15,923,967** | **$10,750,128** | **$26,674,095** | **$6,668,524** | **191** |

## Table 6.9. Hot Springs County 0.2% Annual Chance Flood Zone by Jurisdiction and Property Type

| Jurisdiction | Property Type | Building Count | Improved Value | Est. Content Value | Total Exposure | Potential Loss | Population |
|---|---|---|---|---|---|---|---|
| Thermopolis | Commercial | 9 | $1,475,920 | $1,475,920 | $2,951,840 | $737,960 | |
| | Industrial | 1 | $238,624 | $357,936 | $596,560 | $149,140 | |
| | Residential | 102 | $5,146,446 | $2,573,223 | $7,719,669 | $1,929,917 | 216 |
| | Vacant Land | 2 | $191,281 | $191,281 | $382,562 | $95,641 | |
| | **Total** | **114** | **$7,052,271** | **$4,598,360** | **$11,650,631** | **$2,912,658** | |
| | **Grand Total** | **114** | **$7,052,271** | **$4,598,360** | **$11,650,631** | **$2,912,658** | 216 |

Based on this analysis, the unincorporated county area has approximately 85 improved parcels are within the 100-year floodplain for a total value of $21M. Thermopolis and East Thermopolis have 17 and 18 parcels in the 100-year floodplain, respectively. 114 improved parcels fall within the 500-year floodplain in Thermopolis for a total value of $11M. No flood risk was identified in Kirby.

## Table 6.10. Estimated Economic Losses from Flooding - HAZUS

| Municipality | Building Loss ($K) | Contents Loss ($K) | Inventory Loss ($K) | Relocation Loss ($K) | Capital Related Loss ($K) | Wages Loss ($K) | Rental Income Loss ($K) | Total Loss ($K) | # of Displaced People | # of People Needing Short Term Shelter |
|---|---|---|---|---|---|---|---|---|---|---|
| East Thermopolis | 829 | 682 | 3 | 2 | 2 | 3 | - | 1,521 | 54 | 26 |
| Kirby | - | - | - | - | - | - | - | - | - | - |
| Thermopolis | 9,264 | 17,311 | 413 | 44 | 98 | 570 | 22 | 27,722 | 506 | 320 |
| Unincorporated | 5,378 | 11,087 | 137 | 18 | 37 | 88 | 4 | 16,749 | 152 | 29 |
| TOTAL | **15,471** | **29,080** | **553** | **64** | **137** | **661** | **26** | **45,992** | **712** | **375** |

## Table 6.11. HAZUS Loss Estimation Additional Analysis

| Municipality | 2009 Population | Total Exposure ($K) | Building Loss ($K) | Building Exposure ($K) | % Building Loss | Contents Loss ($K) | Contents Exposure ($K) | % Contents Loss | Total Loss ($K) | Per Capita Loss ($) |
|---|---|---|---|---|---|---|---|---|---|---|
| East Thermopolis | 264 | 25,881 | 829 | 16,509 | 5.0% | 682 | 9,372 | 7.3% | 1,521 | 5,761 |
| Kirby | 53 | 6,106 | - | 3,709 | 0.0% | - | 2,397 | 0.0% | - | - |
| Thermopolis | 2,948 | 338,368 | 9,264 | 205,306 | 4.5% | 17,311 | 133,062 | 13.0% | 27,722 | 9,404 |
| Unincorporated | 1,325 | 168,810 | 5,378 | 97,684 | 5.5% | 11,087 | 71,126 | 15.6% | 16,749 | 12,641 |
| TOTAL | **4,590** | **539,165** | **15,471** | **323,208** | **4.8%** | **29,080** | **215,957** | **13.5%** | **45,992** | **10,020** |

According to the HAZUS model output, Hot Springs County would suffer a total of $45,992,000 in total direct economic loss to buildings and 712 people would be displaced in the event of a countywide 100-year flood. There would be a total of 133 damaged buildings, 28 of which would be substantially damaged (>50% damaged). The Bighorn River flows north through Thermopolis, East Thermopolis, and Kirby. Per the HAZUS analysis, the Town of Thermopolis would suffer the most damage in the county, with a total direct economic loss for buildings of $27,722,000 and 506 displaced people. Note that the floodplain generated by HAZUS is approximate and more representative of a flood greater than the 1% annual chance event in Thermopolis. The Town of East Thermopolis has the greatest Percent Building Loss (5.0%) and the Town of Thermopolis has both the greatest Percent Contents Loss (13.0%) and Per Capita Loss ($9,404) of the jurisdictions in the county. The total county, incorporated and unincorporated, would suffer 4.8% Building Loss, 13.5% Contents Loss, and $10,020 Per Capita Loss.

## Critical Facility Analysis

A GIS analysis of critical facilities indicated that some are located in flood hazard areas. This includes 13 bridges. For more detailed information on critical facilities within the flood hazard areas, refer to the electronic appendix of Critical Facility information. The Town of Thermopolis water treatment and wastewater treatment facilities are located in the 1% annual chance flood zone. There is a decommissioned bridge over the Bighorn River near these water facilities that has limited freeboard above the river during higher flows which could cause debris to dam against it and exacerbate flooding near the treatment plants. This also presents a hazard to boaters on the river.

## Flood Insurance Claims Analysis

The table below lists details regarding the flood insurance policies in the County. All five of the flood insurance policies in the Unincorporated County are Preferred Risk policies for properties located outside of the mapped 100-year floodplain. In the Town of Thermopolis, three of the eight policies are in numbered A-Zones for a total coverage of $222,700. The remaining five are Preferred Risk policies for a total coverage of $1,120,000.

## Table 6.12. NFIP Insurance Policies and Claims Analysis (as of April 30, 2016)

| CID | Community Name | Total Policies | Total Coverage | Total Premium | Total Claims Since 1978 | Total Paid Claims Since 1978 | Total Payments Since 1978 |
|---|---|---|---|---|---|---|---|
| 560097 | Unincorporated County | 5 | $1,540,000 | $1,854 | 0 | 0 | $0 |
| 560026 | Thermopolis | 8 | $1,342,700 | $4,903 | 1 | 0 | $0 |
| 560025 | East Thermopolis | 0 | **0** | 0 | 0 | 0 | $0 |
| 560102 | Kirby | 0 | **0** | 0 | 0 | 0 | $0 |
| | **County Total** | **13** | **$2,882,700** | **$6,751** | **1** | **0** | **$0** |

Source: http://www.fema.gov/policy-claim-statistics-flood-insurance and Wyoming Office of Homeland Security, State NFIP Coordinator

**Repetitive Loss Properties:** There are no reported Repetitive Loss properties in the County.

**Community Rating System:** Neither the County nor any of the communities participate in the CRS program.

The table below indicates the status of flood hazard mapping and NFIP participation. According to the National Flood Insurance Program Community Status Book Hot Springs County has no Special Flood Hazard Area (SFHA), which means all the unincorporated areas are Zone C, or minimally flood prone. This means that the unincorporated areas may have ponding or local drainage problems that don't warrant a detailed study or designation of a base floodplain. The incorporated communities of East Thermopolis and Thermopolis have been mapped. However, there is no Digital Flood Insurance Rate Map. Kirby is in the NFIP but has not been mapped.

## Table 6.13. NFIP Mapping Information

| CID | Community Name | FIRM Effective Date | NFIP Participation/Date Joined |
|---|---|---|---|
| 560097 | Unincorporated County | No SFHA | 11/19/97 |
| 560026 | Thermopolis | 01/20/99 | 07/17/78 |
| 560025 | East Thermopolis | 03/23/99 | 03/23/99 |
| 560102 | Kirby | N/A | 01/10/01 (Emergency Entry) |

### 6.3.8 Hail

Vulnerability to hail is not noticeably different from the rest of the region. Refer to Chapter 4 for a discussion of hail risk related to Hot Springs County and the Region. Members of the HMPC noted that the 1982 hail storm had significant impacts which also impacted the Hot Springs State Park.

### 6.3.9 Hazardous Materials

Hazardous materials vulnerability is significant in the County for transportation accidents due to the highways and railroad that passes through the County and all municipalities. Hazardous Materials facilities are listed in the Critical Facilities section of this annex in Section 2.7.2. Refer to Chapter 4 for a discussion of hazardous materials risk in the Region and County. The HMPC also noted that the railroad and pipelines pose a major concern. The County LEPC has an inventory of rail transported hazardous materials, but no commodity flow study related to the highway. Given the highway and railroad proximity to Thermopolis and East Thermopolis these municipalities have a high vulnerability to hazardous materials incidents.

### 6.3.10 High Wind

Refer to Chapter 4 for a discussion of wind risk related to Hot Springs County and the Region.

### 6.3.11 Landslide, Debris Flow and Rockfall

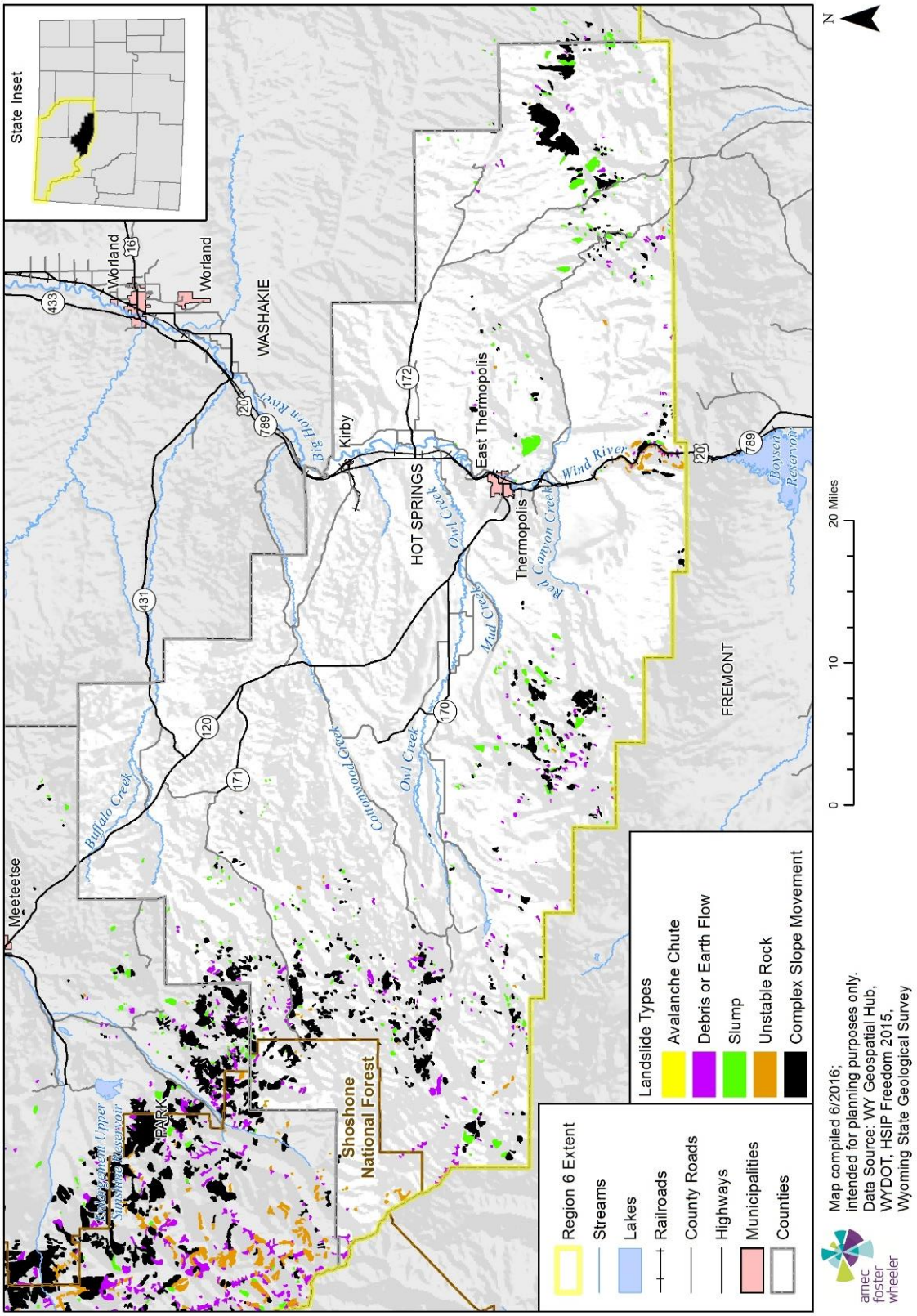
Hot Springs County has a higher hazard significance rating for landslides than most counties in the region reflecting high risk to transportation (highway and rail) and travelling public in Wind River Canyon and economic impacts of highway and rail closures due to landslides. During the Hot Springs County Risk Assessment and Goals Meeting, members of the HMPC noted the following consequences of landslides:

- GIS analysis did not indicate risk to existing development but planning committee noted that slumps are near six or more houses in Wind River Canyon, near Wolf Creek;
- Regional economic impacts from landslides can be substantial. The highway in the Wind River Canyon was closed for 3 days in May 2015 during Memorial Day weekend;
- The landslides and debris flows in May 2015 damaged train tracks and blocked the highway for a few days.
- Another incident in the Canyon caused a train derailment May 2010. Crew was transported to hospital with hypothermia from being in the river. The derailment was caused by a boulder on the track.
- Also has the potential to trigger a transportation hazardous materials incident.

Below is a map of landslide hazards in Hot Springs County. Additional details on these mapped landslide areas can be referenced in the Region 6 Landslide Appendix (Appendix B) by USGS quadrangle.

While the risk is primarily in the unincorporated areas the municipalities are all vulnerable to indirect impacts of landslides when the highway or railroad is impacted.

## Figure 6.4. Hot Springs County Landslide Hazard Map



One major highway and six county roads in the County intersect landslide areas, as noted in the table below. Landslide, rockfall and debris flow mitigation in the Wind River Canyon on WY 789 has been a priority of WYDOT. According to WYDOT representative on the HMPC they have 17 areas undergoing further investigation but do not currently have the funding to address all needed mitigation.

**Table 6.14. Highways Intersecting Landslide Hazard Areas**

| County | Road Type | Road Name | Segment Count | Length (ft.) | Length (m) |
|---|---|---|---|---|---|
| Hot Springs | County Road | CR 36 | 1 | 1,692 | 0.3 |
| | County Road | CR 4 | 1 | 1,103 | 0.2 |
| | County Road | CR 5 | 9 | 6,579 | 1.2 |
| | County Road | CR 7 | 3 | 5,023 | 1.0 |
| | State Highway | WY 789 | 7 | 7,498 | 1.4 |
| | **Total** | | **21** | **21,895** | **4.1** |

### Critical Facility Analysis

A GIS analysis of critical facilities did not identify any located within landslide hazard areas. The Thermopolis water plant is near a stabilized landslide that has potential for future movement according to a geologist present at a public meeting.

## 6.3.12 Lightning

Vulnerability to lightning is not noticeably different from the rest of the region. The HMPC noted the following regarding this hazard in Hot Springs County:

- Communications towers are grounded, as are some substations; and
- Lightning Detection/Monitoring by Federal Government (BLM/Interagency) helps mitigate wildfire starts by sending maps to fire departments.

## 6.3.13 Mine Subsidence

During the Hot Springs County Risk Assessment and Goals Meeting, members of the HMPC commented that there are some areas of mine and natural subsidence in Hot Springs County.

- The Gebo mine area has been reclaimed per the Wyoming Geological Survey;
- Natural sinkholes in limestone at Legend Rock, golf course, and Anchor Dam; and
- While not a subsidence hazard per se, a potential public safety hazards exist with cisterns in certain areas. These are typically 20’ deep by 5’ wide.

## 6.3.14 Tornado

The HMPC noted that while tornadoes occur in the county, they historically occur in undeveloped areas and are not very strong. Refer to Chapter 4 for a discussion of tornado risk related to the Region.

## 6.3.15 Wildfire

Wildfire is a high significance hazard for the County, consistent with other counties in the Region. The Hot Springs County HMPC, however, noted that the WUI is not as extensive as other parts of Wyoming as many of the forested areas are not inhabited. The group noted that Cottonwood Ventures subdivision in the unincorporated county having the highest risk and highest value homes in the WUI. Range land and grass fires can be a threat both to property and livestock and can also allow invasive species to spread. Thermopolis has been threatened by wildfire in the past. The railroad has also seen impacts from fires. Other impacts include air quality, even from fires hundreds of miles away.

One method of estimating vulnerability to wildfires is to determine the value of structures that are located within Redzones, or wildland fire building exposure values. Wildland fire building exposure value is the value of buildings that can be potentially damaged by wildland fire in an area. The Redzone analysis also includes a buffer zone to exhibit potential areas at risk within 2 miles of the Redzone. Since wildfires can spread rapidly, it is important to consider areas close to the Redzone boundary. The table below summarizes Redzone exposure by property type and jurisdiction in Hot Springs County.

**Table 6.15. Redzone Fire Hazard by Jurisdiction and Property Type**

| Jurisdiction | Property Type | Building Count | Improved Value | Est. Content Value | Total Exposure | Population |
|---|---|---|---|---|---|---|
| Thermopolis | Residential | 11 | $2,357,989 | $1,178,995 | $3,536,984 | 23 |
| Hot Springs Unincorporated | Commercial | 20 | $7,390,394 | $7,390,394 | $14,780,788 | |
| | Industrial | 3 | $643,139 | $964,709 | $1,607,848 | |
| | Residential | 90 | $11,153,757 | $5,576,879 | $16,730,636 | 191 |
| | **Sub Total** | **113** | **$19,187,290** | **$13,931,981** | **$33,119,271** | |
| | **County Total** | **124** | **$21,545,279** | **$15,110,976** | **$36,656,255** | **214** |

## 6.3.16 Winter Weather

Vulnerability to winter weather is not noticeably different from the rest of the region. Refer to Chapter 4 HIRA for a discussion of winter weather risk related to Hot Springs Count and the Region. During the Hot Springs County Risk Assessment and Goals Meeting, members of the HMPC commented on this hazard in Hot Springs County:

- Power failures have occurred and caused occasional facility damage;
- 2014 shed and roof damage; there are a number of flat roofed buildings in the County;
- East Thermopolis has been undergrounding utilities to help mitigate impacts; and
- Tree damage has also been an issue

## 6.4 Mitigation Capabilities Assessment

As part of the regional plan development, the Region and participating jurisdictions developed a mitigation capability assessment. Capabilities are those plans, policies and procedures that are currently in place that contribute to reducing hazard losses. Combining the risk assessment with the mitigation capability assessment results in "net vulnerability" to disasters and more accurately focuses the goals, objectives, and proposed actions of this plan. The HMPC used a two-step approach to conduct this assessment. First, an inventory of common mitigation activities was made through the use of a matrix. The purpose of this effort was to identify policies and programs that were either in place or could be undertaken, if appropriate. Second, the HMPC conducted an inventory and review of existing policies, regulations, plans, projects, and programs to determine if they contribute to reducing hazard related losses.

### 6.4.1 Hot Springs County Regulatory Mitigation Capabilities

Table 6.16 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Hot Springs County. Excerpts from applicable policies, regulations, plans and programs descriptions follow to provide more detail on existing mitigation capabilities.

## Table 6.16. Hot Springs County Mitigation Capabilities

| Regulatory Tool (ordinances, codes, plans) | Y/N | Notes |
|---|---|---|
| County Comprehensive Plan | Y | |
| Zoning ordinance | N | |
| Growth management ordinance | N | |
| Floodplain ordinance | N | |
| Other special purpose ordinance (stormwater, steep slope, wildfire) | N | |
| Building codes | N | |
| Fire department ISO rating | | |
| Erosion or sediment control program | N | |
| Stormwater management program | N | |
| Site plan review requirements | Y | |
| Capital improvements plan | Y | |
| Economic development plan | N | |
| Local emergency operations plan | Y | |
| Other special plans | Y | Community Wildfire Protection Plan 2011 |
| Flood insurance study or other engineering study for streams | N | |
| Elevation certificates (for floodplain development) | N | |
| Flood Damage Prevention Resolution | N | |
| Land Use Plan | Y | |
| Subdivision & Development Regulations | N | |

Source: HMPC

As indicated in the table above, Hot Springs County has several plans and programs that guide the County's mitigation of development in hazard-prone areas.

### Hot Springs County Administrative and Technical Mitigation Capabilities

Table 6.17 identifies the County personnel responsible for activities related to mitigation and loss prevention in Hot Springs County.

## Table 6.17. Hot Springs County Administrative/Technical Mitigation Capabilities

| Personnel Resources | Yes/No | Department/Position |
|---|---|---|
| Planner/engineer with knowledge of land development/land management practices | Y | |
| Engineer/professional trained in construction practices related to buildings and/or infrastructure | N | |
| Planner/engineer/scientist with an understanding of natural hazards | N | |
| Personnel skilled in GIS | N | |
| Full time building official | N | |
| Floodplain manager | N | |
| Emergency manager | Y | |
| Grant writer | N | |
| Other personnel | Y | Public Health Response Coordinator |
| GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.) | Y | Assessor's office |
| Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals) | Y | |
| Other | | |

## Capability Summary

The Wyoming State Multi-Hazard Mitigation Plan summarizes existing mitigation capabilities of each county and some of their incorporated cities. The information was derived from county websites and through completed worksheets from the County Coordinators. The table below presents a summary of Hot Springs County's mitigation capabilities from the Wyoming State Mitigation Plan.

**Table 6.18. Summary of Hot Springs County Mitigation Capabilities**

| Building Codes | Comprehensive Planning | Floodplain Management | GIS & Planning | Land Use Regulations | Mitigation Plan |
|---|---|---|---|---|---|
| No County building codes.<br><br>Town of Thermopolis enforces the 2006 IBC. | 2002 Land Use Plan | East Thermopolis FIRM: 03/23/99; Thermopolis FIRM: 01/20/99<br>Countywide: NSFHA | Thermopolis utilizes a private engineering contractor | Thermopolis has a Town Code | No plan prior to 2016 |

Source: Wyoming Multi-Hazard Mitigation Plan 2016

# 6.5 Mitigation Strategy

This section describes the mitigation strategy and mitigation action plan for Hot Springs County. See Chapter 5 of the base plan for more details on the process used to develop the mitigation strategy.

## 6.5.1 Mitigation Goals

The Hot Springs County HMPC developed the following mission statement and three broad goals specific to the County and its jurisdictions:

**Mission Statement: Reduce or eliminate risk to human life and property from hazards**

**Goal 1 Strengthen Public Infrastructure**

**Goal 2 Improve Existing Mitigation Capabilities**

**Goal 3 Reduce Economic Losses due to Hazard Events including costs of Response and Recovery**

These goals were based on a review of the 2016 Wyoming Hazard Mitigation Plan (HMP) and other mitigation plans in the Region but generally align with the Wyoming HMP goals.

## 6.5.2 Mitigation Actions

This section provides details on the actions identified during the 2016 Regional Plan development.

As a part of the 2016 regional planning process, the HMPC developed a list of hazard mitigation actions or projects specific to Hot Springs County and its jurisdictions. The process used to identify, develop and prioritize these actions is described in Chapter 5 of the base plan. Listed below are the proposed actions, the hazards they intend to mitigate, jurisdiction specifics, primary agencies, priority, and estimated timeframe and costs involved. Per the DMA requirement, actions have been identified that address reducing losses to existing development as well as future development. Those that reduce losses to future development are indicated by an asterisk (*) in the "Proposed Mitigation Action Description" column in Table 5.1. Also important to reducing losses to future development is continued compliance with the NFIP. The jurisdictions that participate in the NFIP (County, Thermopolis, East Thermopolis, and Kirby) will continue to make every effort to remain in good standing with the program. This includes continuing to comply with the NFIP in regards to adopting floodplain maps and implementing, maintaining and updating floodplain ordinances. See Section 5.4.2 in the base plan for more discussion on NFIP compliance. Related to this is the need for better floodplain mapping to support floodplain management which is noted in a specific action in the following table.

## Table 6.19. Hot Springs County Mitigation Actions

| ID # | Proposed Mitigation Action description | Hazard (s) | Jurisdiction | Lead and Partner Agencies | Estimated Project Completion Date | Estimated Cost and source of funding | Priority |
|---|---|---|---|---|---|---|---|
| 1 | Update Boysen Dam emergency action plan. | Dam Failure | County, Thermopolis, East Thermopolis, and Kirby | County Emergency Management, US Bureau of Reclamation | Jan-17 | Low | Low |
| 2 | Dam failure evacuation route planning and designations using same concepts as Tsunami evacuation route with signage, mapping and public awareness and emergency notifications. Public information/awareness and/or signage for visitors/tourists could help mitigate loss of life. Finish conducting 5 community-wide exercises | Dam Failure | County, Thermopolis, East Thermopolis, and Kirby | County Emergency Management, Local Law Enforcement, WHP, WYDOT, Road and Bridge, Thermopolis and E Thermopolis Streets Division, Kirby administration | Planning underway in 2016; Complete by May 2017 | $2,500 estimated for signage | High |
| 3 | Coordination and Sharing of Drought Monitoring Information<br>-Education and sharing on sources of information including www.drought.gov<br>-BLM provides fuel moisture monitoring | Drought | County, Thermopolis, East Thermopolis, and Kirby | County Emergency Management in coordination with BLM, municipalities, State Forestry, NWS, NRCS | Annually in the spring and more frequently during times of drought | Low | Medium |
| 4 | Provide education and outreach to raise awareness of earthquake hazards so residents understand how the can reduce earthquake losses and react appropriately during an event. This project includes continuing to provide the 'Earthquakes in Wyoming' brochure at county and municipal offices. This project could include annual participation in the Great Wyoming Shakeout as part of a national awareness program held each October. | Earthquake | County, Thermopolis, East Thermopolis, and Kirby | County Emergency Management | Annually. Next Wyoming shakeout is October 20, 2016. | Low | Low |

| ID # | Proposed Mitigation Action description | Hazard (s) | Jurisdiction | Lead and Partner Agencies | Estimated Project Completion Date | Estimated Cost and source of funding | Priority |
|---|---|---|---|---|---|---|---|
| 5 | Improve identification of expansive soils in areas of new development through geotechnical testing and require appropriate mitigation techniques such as engineered foundations. Include the Identification of high groundwater areas needing special consideration for septic systems. | Expansive Soils, Land Subsidence | County | Planning and County Emergency Management | 2018 | Low | Low |
| 6 | Mitigate stormwater runoff problems on existing and future county road improvements.*<br>This project would reduce stormwater runoff problems through incorporation of runoff considerations associated with new road development or improvements. Existing problem areas that need mitigation will be identified and investigated further. | Flood | County | County Road and Bridge | Identify problem areas by December 2016. With implementation through 2021 | High - Project funding could be FEMA, state | Low |
| 7 | Request NFIP Floodplain Mapping.*<br>The County is not mapped in the NFIP which makes it difficult to properly assess risk and regulate floodplain development. Maps for Thermopolis and E Thermopolis exist but are outdated and not in digital format. This project entails requesting additional mapping studies from FEMA through the state. | Flood | County, Thermopolis, East Thermopolis, and Kirby | Planning, WYOHS, FEMA | 2021 | High, FEMA and State WYOHS | High |

| ID # | Proposed Mitigation Action description | Hazard (s) | Jurisdiction | Lead and Partner Agencies | Estimated Project Completion Date | Estimated Cost and source of funding | Priority |
|---|---|---|---|---|---|---|---|
| 8 | Enhance floodplain management in the Unincorporated County.* The county is not mapped in the NFIP which makes it difficult to properly assess risk and regulate floodplain development (see related action on floodplain mapping) to reduce flood risk. This project would investigate ways to monitor and recommend safe development in suspected, but not mapped, floodplain areas. This could include developing a system to track new buildings with a permit system. This could also include first floor elevation requirements for new buildings in close proximity of the Bighorn River. | Flood | County | Planning | 2021 Dependent on mapping timing | Low | Low |
| 9 | Mitigate repetitive flooding on Kirby Creek between Black Mountain Road and Bighorn River (near Highway 172 and Skelton Rd). Flooding occurs on a nearly annual basis that threatens agricultural areas, livestock, roads and some homes and other structures | Flood | County | County Road and Bridge, County Emergency Management | December 2017 | Medium; funding sources County, state, FEMA mitigation grants | High |
| 10 | Rehabilitate or remove the old 6th street bridge over the Bighorn River between Thermopolis and the water treatment plant to prevent buildup of debris and diversion of water during high flows into the treatment plant and wastewater lagoon.<br>A gas and water line on bridge may also need protection. At a minimum removing the decking on the bridge may alleviate some issues. This bridge also is a hazard to boaters due to its minimal freeboard during higher flows. | Flood | Thermopolis | Town of Thermopolis Public Works, County Emergency Management | 2019 | Medium; FEMA mitigation grants | Medium |

| ID # | Proposed Mitigation Action description | Hazard (s) | Jurisdiction | Lead and Partner Agencies | Estimated Project Completion Date | Estimated Cost and source of funding | Priority |
|---|---|---|---|---|---|---|---|
| 11 | Improve public education with how to respond / shelter during hazardous materials incidents. Implementation ideas include:<br>Build on DOT Emergency Response Guides (ERGs)<br>Encourage the use of Code Red and smart phone apps. | Hazardous Materials | County | County Emergency Management | Ongoing through 2021 | Low - ERGs are online and available for free | High |
| 12 | Encourage WYDOT to continue landslide stabilization / rock fall mitigation efforts in Wind River Canyon to reduce direct and indirect impacts to travelers. Areas that need attention have been identified but more funding needs to be secured to address the hazard more holistically. | Landslide | County, Thermopolis, East Thermopolis, and Kirby | WYDOT | Ongoing through 2030 | High - Projects could run in the millions of dollars. WYDOT and FHWA | High |
| 13 | Coordination with BNSF to see if information sharing could be enhanced related to any improved monitoring systems related to rockfall and landslides in Wind River Canyon | Landslide | County | County Emergency Management and Burlington Northern, Northern Arapahoe and Eastern Shoshone Emergency Management | December 2016 | Low | Medium |
| 14 | Community Information on Fire Wise Practices | Wildfire | County, Thermopolis, East Thermopolis, and Kirby | County Fire Warden, Thermopolis Fire Department, County Emergency Management | Ongoing through 2021 | Low | Low |

| ID # | Proposed Mitigation Action description | Hazard (s) | Jurisdiction | Lead and Partner Agencies | Estimated Project Completion Date | Estimated Cost and source of funding | Priority |
|---|---|---|---|---|---|---|---|
| 15 | Reduce fuel loads (both man-made and natural) within incorporated and unincorporated areas of the county.<br>-Fuel loads include junk vehicles, old buildings, brush piles, high grasses, sagebrush<br>-Consider stricter enforcement of ordinances that deal with cleanliness of property<br>-Consider adopting other ordinances | Wildfire | County, Thermopolis, East Thermopolis, and Kirby | County Fire Warden, Thermopolis Fire Department and Town Planner, County Emergency Management, County Land Use Planning Board | 2018 | Low | Medium |
| 16 | Develop a community action plan for community evacuation | Wildfire, Flood, Dam Failure, Hazardous Materials | County, Thermopolis, East Thermopolis, and Kirby | County Emergency Management with local law enforcement, WYDOT, WY Highway Patrol | Planning underway in 2016; Complete by Sept 2017 | Low | Low |
| 17 | Designate and train a County Public Information Officer(s) to provide public education and awareness information prior to and during an event. | Wildfire, Flood, Dam Failure, Winter Storm, Tornado, Hail, Hazardous Materials | County | County Emergency Management and County Public Health | Ongoing through 2018 | Low | Low |
| 18 | Develop community awareness of Sirens and Code Red | Wildfire, Flood, Dam Failure, Winter Storm, Extreme Cold, Tornado, Hail, Hazardous Materials | County | County Emergency Management | Ongoing annually through 2021 | Low | Low |

| ID # | Proposed Mitigation Action description | Hazard (s) | Jurisdiction | Lead and Partner Agencies | Estimated Project Completion Date | Estimated Cost and source of funding | Priority |
|---|---|---|---|---|---|---|---|
| 19 | Explore the applicability of building codes in the unincorporated county to reduce vulnerability of structures to weather and wildfire events.* | Wildfire, Flood, Wind, Winter Storm, Extreme Cold, Tornado, Hail, Lightning | County | County Land Use Planning Board and Hot Springs County Board of Commissioners | 2017 | Low | Low |
| 20 | Implement wildfire mitigation recommendations identified in the County CWPP | Wildfire | County | County Fire Warden, Thermopolis Volunteer Fire Department | Annually through 2021 | Low | Medium |
| 21 | Rangeland wildfire mitigation through management practices | Wildfire | County | County Fire Warden and BLM | Annually through 2021 | Low | Medium |

*Addresses avoiding losses to future development

## 6.5.3 Implementation

Moving forward the Hot Springs County HMPC will use the mitigation action table in the previous section to track progress on implementation of each project. Implementation of the plan overall is discussed in Chapter 6.

### Incorporation into Existing Planning Mechanisms

Also discussed in Chapter 6 is the importance of implementation and incorporation of the principles of this plan into other planning mechanisms.

As described in the capability assessment, the County already implements policies and programs to reduce losses to life and property from hazards. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through these other program mechanisms. Where applicable, these existing mechanisms could include:

- County or community comprehensive plans
- County or community development codes
- County or community Emergency Operations Plans
- Threat and Hazard Identification and Risk Assessments (THIRA)
- Community Wildfire Protection Plan (CWPP)
- Capital improvement plans and budgets
- Recovery planning efforts
- Watershed planning efforts
- Wildfire planning efforts on adjacent public lands
- Master planning efforts
- River corridor planning efforts
- Hot Springs State Park Master Plan
- WYDOT Wind River Canyon rockfall and landslide mitigation
- Other plans, regulations, and practices with a mitigation aspect

The process for incorporation of the Regional Hazard Mitigation Plan into other planning mechanisms can be as simple as cross-referencing the Hazard Mitigation Plan where applicable. Integrated planning is a key to building community resiliency.